REMARKS

Claims 1 - 14 remain active in this application. Claims 1 and 8 have been amended to improve clarity but without alteration of intended scope. Support for the amendments of the claims is found throughout the application, particularly in Figure 3 and the description thereof on pages 12 - 14. No new matter has been introduced into the application.

Claims 1, 4, 5, 7, 8, 11, 12 and 14 have been rejected under 35 U.S.C. §102 as being anticipated by Brogardh et al. Claims 2, 3, 9 and 10 have been rejected under 35 U.S.C. §103 as being unpatentable over Brogardh et al. in view of Wang. Claims 6 and 13 have been rejected under 35 U.S.C. §103 as being unpatentable over Brogardh et al. in view of Wlodarczyk. These three grounds of rejection are respectfully traversed.

Initially, it is respectfully pointed out that while the previous amendments recite qualities of crystalline materials, as the Examiner observes, amendment of the claims does not form the basis of any admission as to the propriety of the previously stated grounds of rejection and, by the same token, merely responding to the amendatory matter in further asserted grounds of rejection does not serve to make a *prima facie* demonstration of the propriety of the current grounds of rejection. More specifically, while Brogardh et al. may teach some elements of a sensor to be formed of crystalline material, that fact is not sufficient to demonstrate that all recitations of the claims have been answered by the reference(s) applied, as the Examiner appears to have assumed in the present action.

The present invention is directed to a fiber optic sensor or a telemetry system including a sensor of a type which includes a gap between the end of a fiber

optic element and a reflecting surface wherein the width of the gap is affected by the physical parameter of interest to be sensed or measured. Light input into the optical fiber element will be partially reflected by the end thereof at one side of the gap and a portion of the input light which is transmitted by the end of the optical fiber is reflected from the other side of the gap and will be returned to the optical fiber with a phase delay which varies with the variation of the length of the gap in response to the physical parameter of interest. The phase delay causes interference effects which vary strongly with minute changes in gap length.

The gap is established by a structural element generally in the form of a tube which, in known sensors of this type, has generally been formed of glass, metal or other non-crystalline material. It has been observed that such materials, when subjected to persistent force(s) for an extended period of time, will exhibit viscous flow, volume consolidation or the like, often referred to collectively as "creep" which causes the dimensions thereof to change slightly. In known sensors of this type, such "creep" in the material establishing the gap causes a change in the length of the gap and thus causes drift in the measurement made. The invention, to avoid such "creep" and the resultant measurement drift, establishes the gap using an element formed of crystalline material which does not exhibit creep or volume consolidation even when subjected to persistent force(s).

The sensor of Brogardh et al. is of a very different type and operates in accordance with very different principles even though it also includes a gap and utilizes interference effects. Like the present invention, light is supplied to the sensor through an optical fiber. However, this light is used to excite a solid body 2 of photoluminescent material (column 2,

lines 64 - 65) which also emits light at a wavelength different from the incident light. The emitted light and possibly incident light is reflected a number of times within the cavity or gap and, if the gap is held to less than one-half of the coherence length of the wavelengths of light of interest, interference effects will occur in the gap and the amount of light transmitted back to the optical fiber will vary with the amplitude at the optical fiber surface which varies in accordance with the interference pattern which, in turn, varies with the gap (column 3, lines 30 - 39).

The gap dimensions are established in Brogardh et al. by a spacer ring 7 and a non-flexible support 9 (column 3, lines 5 - 10) which may also be photoluminescent, apparently if formed by a surface of body 2 (column 4, lines 14 - 23) but must be transparent (column 4, line 33). However, it is *only* solid photoluminescent body 2 which is disclosed or suggested by Brogardh et al. to be crystalline (and then only if made of "semiconductors with a direct band gap" - column 4, line 46), while many other non-crystalline photoluminencent materials are known such as a transparent material with neodymium ions noted at column 4, lines 34 - 38. of Brogardh et al.) while *none* of elements 7, 8 or 9 which establish the gap dimensions are even suggested to be crystalline and there is not even any recognition of the problem addressed by the invention much less any suggestion of using a creep resistant material for any portion of the interference structure 5 - 8 (or 5 - 9, elements 5 and 6 thereof being the surfaces of the gap).

In regard to the explicit recitations of the claims, the possibly crystalline body 2 of Brogardh et al. is not bonded to the fiber optic element and would be inoperative in the intended manner if it were (see In re Gordon, 221 USPQ 1125 (Fed. Circ., 1984)) and does not serve to position the reflective surface at a

location separated from the optical fiber. Therefore, even though Brogardh et al. discloses that photoluminescent body 2 (but not volume 8) *may* be crystalline (but not recognizing any problem of drift due to creep or a solution thereto by establishing the gap with a crystalline material) the *possibly* crystalline material disclosed by Brogarh et al. has no disclosed association with establishment of gap length, much less in the manner explicitly recited. Accordingly, the Examiner has not made a *prima facie* demonstration of anticipation of any claim in the application.

This very basic deficiency of Brogardh et al. is not mitigated by Wang or Wlodarczyk. Wang, while disclosing a sensor of the same general type as the invention, does not teach or suggest establishing the gap dimensions with a crystalline material and the Examiner has not asserted that it does; thereby failing to make a *prima facie* demonstration of obviousness based on the content of Brogardh et al. and Wang. Wlodarczyk discloses a pressure sensor which does not use a gap at a termination of the optical fiber and thus is substantially irrelevant to and cannot mitigate the above-discussed deficiency of Brogardh et al. Again, the Examiner has not asserted that it does and has thereby failed to make a *prima facie* demonstration of obviousness based on the combination of Brogardh et al. and Wlodarczyk. Also, it is respectfully submitted that both Wang and Wlodarczyk are improperly combined with Brogardh et al. since they are each based on principles of operation very different from Brogardh et al. (and each other) and modification of Brogardh et al in accordance with either (or both) would preclude operation of Brogardh et al in the manner intended (and vice-versa) and thus improper under the precedent of In re Gordon, *supra*. The can be no motivation for modification if the intended function is precluded.

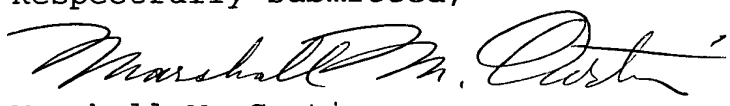
In view of the foregoing, it is clearly seen that each of the grounds of rejection asserted by the Examiner is clearly in error and untenable and no *prima facie* demonstration of the propriety of *any* asserted ground of rejection has been made. Accordingly, it is respectfully submitted that reconsideration and withdrawal of the asserted grounds of rejection are clearly in order and such action is respectfully requested.

It is also respectfully submitted that the finality of the present office action is premature since no action can properly be made final whhich does not contain a *prima facie* demonstration of the grounds of rejection contained therein and particularly where no *prima facie* demonstration of the propriety of the grounds of rejection asserted in the previous action was made. Accordingly, it is respectfully re quested that the finality of the present office action be reconsidered and withdrawn and the above-requested amendments entered as a matter of right. Such action is also believed to be fully justified by the evident confusion on the part of the Examiner in regard to different principle by which different types of fiber optic sensors operate and the different functions of various elements therein in view of the errors in the asserted grounds of rejection discussed above.

Since all rejections, objections and requirements contained in the outstanding official action have been fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

A petition for a three-month extension of time has been made above. If any further extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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